PCT/US 03/ 51131
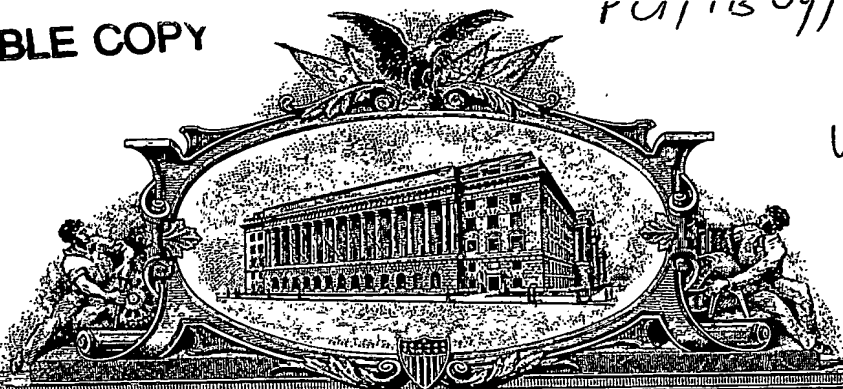
US030270

PA 1093527

THE UNITED STATES OF AMERICA

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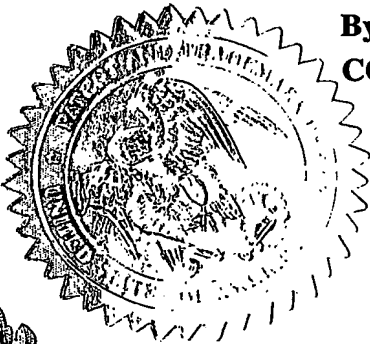
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APPLICATION NUMBER: *60/493,264*
FILING DATE: *August 07, 2003*

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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53 (c).

Express Mail Label No. EV312069919US	Date of Deposit: AUGUST 7, 2003

INVENTOR(S)

Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
HARALD	VAN HORCK	EINDHOVEN, THE NETHERLANDS

☐ Additional inventors are being named on the _____ separately numbered sheets attached hereto

TITLE OF THE INVENTION (280 characters max)

DVB-T THEME HANDLING

CORRESPONDENCE ADDRESS

Direct all correspondence to:

☒ Customer Number   24737   ➡   ***24737***

OR   *Type Customer Number here*

☐	Firm or Individual Name	
Address		
Address		
City		State		ZIP	
Country		Telephone		Fax	

ENCLOSED APPLICATION PARTS (check all that apply)

☒ Specification *Number of Pages*   33   ☐ CD(s), Number

☐ Drawing(s) *Number of Sheets*   ☐ Other (specify)

☐ Application Data Sheet. See 37 CFR 1.76

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT (check one)

☐ Applicant claims small entity status. See 37 CFR 1.27.

☐ A check or money order is enclosed to cover the filing fees

FILING FEE AMOUNT ($)

☒ The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: 14-1270   160.00

☐ Payment by credit card. Form PTO-2038 is attached.

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are: _____.

Respectfully submitted,

SIGNATURE _____

Date   7 August 2003

REGISTRATION NO.: 39,703

TYPED or PRINTED NAME   DICRAN HALAJIAN

Docket Number: US030270

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USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

The invention is related to sorting mechanism of services in the system-lists of receivers such as DVB-T receivers, and more particularly, to fast service scan and sorting in receivers, including sorting of logical channel numbers (LCNs), as well as handling of themes and parental ratings, such as in Europe.

Sorting is done based on:
1. Type of service. See table 1.
2. Strength. See table 2.
3. Original Network Id. Based on the country-setting, the ON for this country is sorted first.
4. LCN: place the service on the requested LCN if possible, otherwise move to rest.
5. Rest: place the services on the list, starting at the end

Service_type	Description	Dest. List
0x00	Reserved for future use	-
0x01	Digital television service	TV
0x02	Digital radio sound service	RADIO
0x03	Teletext service	OTHER
0x04	NVOD reference service	TV
0x05	NVOD time-shifted service	-
0x06	Mosaic service	-
0x07	PAL coded signal	-
0x08	SECAM coded signal	-
0x09	D/D2-MAC	-
0x0A	FM Radio	-
0x0B	NTSC coded signal	-
0x0C	data broadcast service	OTHER (MHEG?)
0x0D	Reserved for Common Interface Usage	-
0x0E	RCS Map (see EN 301 790 [24])	-
0x0F	RCS FLS (see EN 301 790 [24])	-
0x10	DVB MHP service	OTHER
0x0D to 0x7F	Reserved for future use	-
0x80 to 0xFE	user defined	-
0xFF	reserved for future use	-

Table 1: service type selection

All services found should remain in the list, except for:
- exact doubles. Highest BERQ will stay in the list, the other(s) is(are) discarded.
- Services with a BERQ below a threshold level will be discarded (see table 2, only initial values)

Service list:	Threshold level:
TV	80
Radio	70
Other	80

Table 2: Service vs threshold level

Regional services with the same LCN shall stay in the list. Only one service can be assigned its LCN. The system should decide based on the BERQ which service to put at the correct LCN. The service with the highest BERQ is assigned the correct LCN. The other service is moved to the end of the list. (ON 1 rest in table 2)

If services are assigned a high LCN which means there is no gap between the LCN based block, and the ON rest block, it is sorted in the ON rest section and the LCN is discarded.

Graphically, this should end up in a service list looking like table 3 if 3 ON id's are identified, where ON 1 is the ON_ID for the current country:

Description:	
ON 1 based on LCN	
ON 1	Alphabetically.
ON 2	Alphabetically.
ON 3	Alphabetically.

Table 3: System defined preset-list

Through the zapper the user sees all ON 1 services first, which adhere to the designated LCN as much as possible. Then services from other ON's are grouped together, in alphabetical order per ON.

Additional notes:
Currently there are 2 lists, one for TV, one for RADIO. Other list may be added. According to the FRS only the TV and RADIO lists have 4 favorite lists each.

Also the system-defined list may be added.

The data broadcast service (service_type 0x0C) has been added. A stream with just MHEG content may use this type.

BER vs. BERQ:

2

This information gives a quick way to estimate bitstream quality. This information is derived from BER at Reed-Solomon decoder input. It is the negative logarithm in base 10 of BER multiplied by 32.

$$BERQ = -32*LOG10(BER)$$

BERQ range is 1.. 255. It saturates to 255 even if BER is better than 10^{-8}. If this information is not computed, its value is always 0. Usually, one can consider than values from 1 to roughly 80-90 correspond to totally corrupted signal, up to 110-120, partially corrupted signal and above 130, error free signal.

BER between	tDEMOD_BERQ
$0 .. 1.075*10^{-8}$	255
$1.075*10^{-8} .. 1.155.10^{-8}$	254
... ...	
0.86 .. 0.93	2
0.93 .. 1 or unlock	1
unimplemented	0

Fast Service Scan for DVB-T Receivers:

Most receivers use a full range frequency scan to find services. This is a rather slow process, and can take up to 20 minutes for a full range scan for most receivers. Users are usually warned for this so at least they know to be patient.

For IDTV including the present invention, the above described behavior has been changed based on the fact that, in various standards, only a number of fixed frequencies are mentioned that will be used in DVB-T broadcasting. Thus, a detector detects the region the IDTV is located, such as from the DVB-T broadcasting, and based thereon the IDTV scans only the relevant fixed frequencies, instead of performing a full scan. This results in a frequency scan that is a factor of 10-20 faster than usual.

A list of such frequencies can be found in various standards, as well as the various country specific standard (in the case of DVB-T). For example, D-book covers UK and Australia, E-book covers Europe, NORDIG covers Norway, Sweden, Finland and Denmark. On top of these standards, some countries have their own standards, usually with extensions to the basic standard they use. Australia is such an example having specification based on D-book but extending it.

Since the frequency table is fixed in the product, in situations where the used frequencies change, then a way to update this table is needed. For most DVB-T receivers this is feasible through software download and/or flash card. In practice, usually these frequency ranges are quite rare.

This feature can be used as a commercial benefit, since it is not uncommon to perform a new install on a DVB-T receiver since most networks are not really stable yet. This reinstall will be performed much faster than competitors can.

Logical Channel Number Sorting:

For DVB-T receivers, LCN (Logical Channel Number) has been constructed to facilitate automatic preset assignment. The actual way how to deal with the assigned presets differs a bit between all major standards, and Australia in particular came up with its own way of using LCN. The illustrative examples do cover Australia and its own LCN interpretation, since this violates the European standards on this (D-book, E-book and NORDIG). However, extending this feature to Australia can also be achieved using the gist of the present invention.

For Europe there is the problem that you can receive (at least in the border areas) DVB-T content from different countries. The user probably wants the LCN as used in his/her country to be the effective one.

This has been achieved by sorting all received services in a particular order. First, all transmissions from the country the set is in (based on a user setting) are given their LCN number. In case of duplicate services two situations occur:

1. Same service, identical, but from different transmitters: only the strongest service is stored.
2. Same service, with regional content (services with regional content, that most of the time broadcast the same content) the strongest service is stored on the LCN as transmitted, the other one is stored in the high range. Decision on strongest service is made on BERQ (Bit Error Rate Quality; range 1-255, the higher the better).

Services originating from another country (based on ONID, Original Network Identification) are inserted at the end, alphabetically sorted and grouped per country.

The end result will be a list of services, looking like this:

Description:	
ON 1 based on LCN	
ON 1 rest	*Alphabetically. sorted*
ON 2	*Alphabetically. Sorted*
ON 3	*Alphabetically. Sorted*

Where ON1 is Original Network Id from the selected country, and ON2 and ON3 are two different countries. In most cases there will be a gap between stations that have an LCN assigned, and stations that do not have this. This is indicated by the empty line in the table.

Theme Handling:

For DVB-T receivers in Europe theme handling is a problem, since D-book and E-book do not agree. Spain introduced its own set of themes, based on E-book with extensions.

The analysis is done in the country specifics document and the end-result is in Appendix A.3. A detector detects the region a DVB-T receiver is located, and based thereon substitutes the proper themes for the detected region in the themes table to be used thereafter. The mix of the standards means acting as follows:

For Spain, interpret the user-nibbles first. If the user-nibbles are set to 0x0 (undefined) then interpret the standard content nibbles. All other countries interpret the standard content nibbles, mapping them to the following table when interpreting only level1:

Nibble:	Theme:
0x00	Undefined
0x01	Movie/Drama
0x02	News/Current affairs
0x03	Show/Game show
0x04	Sports
0x05	Children's / Youth programmes
0x06	Music / Ballet / Dance
0x07	Arts / Culture without music
0x08	Social / Political issues / Economics
0x09	Education / Science / Factual topics
0x0A	Leisure / Hobbies
0x0B	Bullfighting (ESP)
0x0C	Series (ESP)
0x0D	Adult (ESP)
0x0E	Religion (ESP)
0x0F	Drama (UK)

The themes 0x0B .. 0x0F have a code attached to indicate the country they come from. Under normal circumstances these themes will only be used in the respective countries.

Handling of Parental Rating:

In E-book an age-based rating system has been devised. Some countries need extra ratings, or use ratings not specified. In order to overcome this, a table has been constructed to translate the rating as transmitted to an age based rating and back.

Ratings are country dependant. As such, if a rating is found for the current country, this rating is used. If such a rating is not found, but a rating is found for another country, the highest available rating is used to determine whether or not to block a transmission. This translation is based on the following table:

Event Rating (System Rating on left)

System Rating		Age_4 1	Age_5 2	Age_6 3	Age_7 4	Age_8 5	Age_9 6	Age_10 7	Age_11 8	Age_12 9	Age_13 10	Age_14 11	Age_15 12	Age_16 13	Age_17 14	Age_18 15	Universal 17	ParentalApr 18	X-Rated 31
Age_4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Age_5	2	√	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	-
Age_6	3	√	√	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	-
Age_7	4	√	√	√	-	-	-	-	-	-	-	-	-	-	-	-	√	-	-
Age_8	5	√	√	√	√	-	-	-	-	-	-	-	-	-	-	-	√	-	-
Age_9	6	√	√	√	√	√	-	-	-	-	-	-	-	-	-	-	√	√	-
Age_10	7	√	√	√	√	√	√	-	-	-	-	-	-	-	-	-	√	√	-
Age_11	8	√	√	√	√	√	√	√	-	-	-	-	-	-	-	-	√	√	-
Age_12	9	√	√	√	√	√	√	√	√	-	-	-	-	-	-	-	√	√	-
Age_13	10	√	√	√	√	√	√	√	√	√	-	-	-	-	-	-	√	√	-
Age_14	11	√	√	√	√	√	√	√	√	√	√	-	-	-	-	-	√	√	-
Age_15	12	√	√	√	√	√	√	√	√	√	√	√	-	-	-	-	√	√	-
Age_16	13	√	√	√	√	√	√	√	√	√	√	√	√	-	-	-	√	√	-
Age_17	14	√	√	√	√	√	√	√	√	√	√	√	√	√	-	-	√	√	-
Age_18	15	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√	√	-
Universal	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ParentalAppr	17	√	√	√	-	-	-	-	-	-	-	-	-	-	-	-	√	-	-
X-Rated	31	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-

Legends: - Block
√ Play

Event rating: the transmitted rating (highest if no country match was found).
System rating: the system rating as set by the user.
The current table has been completed for all European countries that have their own specification, and can be extended if other countries come up with different ratings.

Country Specifics

Table of content

1 E-BOOK / EN 300 468

Version used: EACEM Technical Report, Number TR-030 version 1.1, date:7 April 2000
ETSE EN 300 468 v1.4.1, date november 2000

1.1   PARENTAL RATING

This optional descriptor is as defined in [7] EN 300 468 and shall conform to appropriate applicable regulation.

The receiver should make use of the parental rating signalled through the parental_
rating_descriptor to inform about the age rating of events containing such information.
CA systems may also be able to provide parental control through their own private methods.
The manufacturer defines the user interface for parental control. It should be configurable and sufficiently safe and shall conform to appropriate applicable regulation.

From EN 300 468:

6.2.25 Parental rating descriptor

This descriptor (see table 64) gives a rating based on age and allows for extensions based on other rating criteria.

Table 64: Parental rating descriptor

Syntax	No. of bits	Identifier
Parental_rating_descriptor(){		
descriptor_tag	8	uimsbf
descriptor_length	8	uimsbf
for (i=0;i<N;i++){		
country_code	24	bslbf
rating	8	uimsbf
}		
}		

Semantics for the parental rating descriptor:

country_code: This 24-bit field identifies a country using the 3-character code as specified in ISO 3166 [2]. Each character is coded into 8-bits according to ISO/IEC 8859-1 [5] and inserted in order into the 24-bit field. In the case that the 3 characters represent a number in the range 900 to 999, then country_code specifies an ETSI defined group of countries. These allocations are found in ETR 162 [6].
EXAMPLE: United Kingdom has 3-character code "GBR", which is coded as:
'0100 0111 0100 0010 0101 0010'.

rating: This 8-bit field is coded according to table 65, giving the recommended minimum age in years of the end user.

Tabl 65: Parental rating descriptor, rating

Rating	Description
0x00	undefined
0x01 to 0x0F	minimum age = rating + 3 years
0x10 to 0xFF	defined by the broadcaster

EXAMPLE: 0x04 implies that end users should be at least 7 years old.

1.2 CONTENT DESCRIPTION

This recommended descriptor is as defined in [7] EN 300 468.

From EN 300 468:

6.2.8 Content descriptor
The intention of the content descriptor (see table 25) is to provide classification information for an event.

Table 25: Content descriptor

Syntax	No. of bits	Identifier
content_descriptor(){		
descriptor_tag	8	uimsbf
descriptor_length	8	uimsbf
for (i=0;i<N;i++) {		
content_nibble_level_1	4	uimsbf
content_nibble_level_2	4	uimsbf
user_nibble	4	uimsbf
user_nibble	4	uimsbf
}		
}		

S mantics of the content descriptor:
content_nibble_level_1: This 4-bit field represents the first level of a content identifier. This field shall be coded according to table26.
content_nibble_level_2: This 4-bit field represents the second level of a content identifier. This field shall be coded according to table26.
user_nibbl : This 4-bit field is defined by the broadcaster.

Table 26: Content_nibble level 1 and 2 assignments

Content_nibble_level_1	Content_ nibble_ level_2	Description
0x0	0x0 to 0xF	undefined content
Movie/Drama:		Movie/Drama:
0x1	0x0	movie/drama (general)
0x1	0x1	detective/thriller
0x1	0x2	adventure/western/war
0x1	0x3	science fiction/fantasy/horror
0x1	0x4	comedy
0x1	0x5	soap/melodrama/folkloric
0x1	0x6	romance
0x1	0x7	serious/classical/religious/historical movie/drama
0x1	0x8	dult movie/drama
0x1	0x9	to 0xE reserved for future use
0x1	0xF	user defined
N ws/Current affairs:		News/Current affairs:
0x2	0x0	news/current affairs (general)
0x2	0x1	news/weather report
0x2·	0x2	news magazine

0x2	0x3	documentary
0x2	0x4	discussion/interview/debate
0x2	0x5	to 0xE reserved for future use
0x2	0xF	user defined
Show/Gam show:		**Show/Game show:**
0x3	0x0	show/game show (general)
0x3	0x1	game show/quiz/contest
0x3	0x2	variety show
0x3	0x3	talk show
0x3	0x4 to 0xE	reserved for future use
0x3	0xF	user defined.*ETSI*
Sports:		**Sports:**
0x4	0x0	sports (general)
0x4	0x1	special events (Olympic Games, World Cup etc.)
0x4	0x2	sports magazines
0x4	0x3	football/soccer
0x4	0x4	tennis/squash
0x4	0x5	team sports (excluding football)
0x4	0x6	athletics
0x4	0x7	motor sport
0x4	0x8	water sport
0x4	0x9	winter sports
0x4	0xA	equestrian
0x4	0xB	martial sports
0x4	0xC to 0xE	reserved for future use
0x4	0xF	user defined
Children's/Youth programmes:		**Children's/Youth programmes:**
0x5	0x0	children's/youth programmes (general)
0x5	0x1	pre-school children's programmes
0x5	0x2	entertainment programmes for 6 to14
0x5	0x3	entertainment programmes for 10 to 16
0x5	0x4	informational/educational/school programmes
0x5	0x5	cartoons/puppets
0x5	0x6 to 0xE	reserved for future use
0x5	0xF	user defined
Music/Ballet/Dance:		**Music/Ballet/Dance:**
0x6	0x0	music/ballet/dance (general)
0x6	0x1	rock/pop
0x6	0x2	serious music/classical music
0x6	0x3	folk/traditional music
0x6	0x4	jazz
0x6	0x5	musical/opera
0x6	0x6	ballet
0x6	0x7 to 0xE	reserved for future use
0x6	0xF	user defined
Arts/Culture without music):		**Arts/Culture (without music):**
0x7	0x0	arts/culture (without music, general)
0x7	0x1	performing arts
0x7	0x2	fine arts
0x7	0x3	religion
0x7	0x4	popular culture/traditional arts
0x7	0x5	literature
0x7	0x6	film/cinema
0x7	0x7	experimental film/video
0x7	0x8	broadcasting/press
0x7	0x9	new media
0x7	0xA	arts/culture magazines
0x7	0xB	fashion
0x7	0xC to 0xE	reserved for future use

0x7	0xF	user defined
Social/Political Issues/Economics:		**Social/Political Issues/Econ mics:**
0x8	0x0	social/political issues/economics (general)
0x8	0x1	magazines/reports/documentary
0x8	0x2	economics/social advisory
0x8	0x3	remarkable people
0x8	0x4 to 0xE	reserved for future use
0x8	0xF	user defined
Children's/Youth programmes:		**Children's/Youth programmes:**
Education/ Science/Factual topics:		**Education/ Science/Factual topics:**
0x9	0x0	education/science/factual topics (general)
0x9	0x1	nature/animals/environment
0x9	0x2	technology/natural sciences
0x9	0x3	medicine/physiology/psychology
0x9	0x4	foreign countries/expeditions
0x9	0x5	social/spiritual sciences
0x9	0x6	further education
0x9	0x7	languages
0x9	0x8 to 0xE	reserved for future use
0x9	0xF	user defined
L isure hobbies:		**Leisure hobbies:**
0xA	0x0	leisure hobbies (general)
0xA	0x1	tourism/travel
0xA	0x2	handicraft
0xA	0x3	motoring
0xA	0x4	fitness & health
0xA	0x5	cooking
0xA	0x6	advertisement/shopping
0xA	0x7	gardening
0xA	0x8 to 0xE	reserved for future use
0xA	0xF	user defined
0xB	0x0	original language
0xB	0x1	black & white
0xB	0x2	unpublished
0xB	0x3	live broadcast
0xB	0x4 to 0xE	reserved for future use
0xB	0xF	user defined
0xC to 0xE	0x0 to 0xF	reserved for future use
0xF	0x0 to 0xF	user defined

1.3 LCN

The logical channel descriptor provides a default channel number label for services. This information is quasi-static. The logical channel descriptor may be inserted once in the second descriptor loop of the NIT. The logical channel number should be unique within the same network_id (except when its value is zero)but may be re-used for regional variants of a service normally under different network_ids. Hence the number is not unique within the original network. The logical channel number does not take into account the service type. See 9.4.4,"Logical channel numbers (LCN)",on page 68.

Syntax	No.of bits	Type
logical_channel_descriptor{		
descriptor_tag	8	Uimsbf
descriptor_length	8	Uimsbf

for (i=0; i<N; i++){		
service_id	16	Uimsbf
visible_service_flag	1	Bslbf
Reserved	5	Bslbf
logical_channel_number	10	Uimsbf
}		
}		

Table 9-12:Syntax of the logical channel descriptor

descriptor_tag This shall be assigned to be 0x83

service_id This is a 16-bit .field which serves as a label to identify this service from any other service within the network. The service_id is the same as the program_number in the corresponding program_map_section. Services shall be included irrespective of their running status.

r served All "reserved " bits shall be set to '1 '.

visible_service_tag This 1-bit field when set to '1 ' indicates that the service is normally visible and selectable (subject to the service type being suitable etc.)via the receiver service list. When set to '0 ' this indicates that the receiver is not expected to offer the service to the user in normal navigation modes however the receiver should provide a mechanism to access these services (for example,by direct entry of the logical channel number).

See also 9.4.4.2,"Receiver rules ",on page 69.

logical_channel_number This is a 10-bit field which indicates the broadcaster preference for ordering services. Its use is defined in table 9-13:

logical_channel_number	Description
0	Service not suitable for selection by the user [a]a]For example,the value zero may be used for data services only intended for selection from interactive applications or for firmware download services etc.
1 -999	logical_channel_number
1000 -1023	rfu

Table 9-13:Logical Channel Number

See also 9.4.4.2,"Receiver rules ",on page 69.

For ease of use it is recommended NOT to use logical channel numbers greater than 99 where possible.

2 FRANCE

Version used: Doc CTE - TNT/GT3 - 03, revised version of 5th July 2001.

2.1 PARENTAL RATING

The levels "Universal viewing" and "Parental approval preferable" do not correspond to any value defined in the rating field coding of the DVB descriptor.

The values 0x10 and 0x11, which are defined by the broadcaster, are thus used to code these two levels.

CSA symbols	Correspondenc	DVB *rating* field hexadecimal (decimal)
GREEN CIRCLE	Universal viewing	0x10 (16)
BLUE CIRCLE	Parental approval preferable	0x11 (17)
ORANGE TRIANGLE	Prohibited to the under 12	0x09 (9)
RED SQUARE	Prohibited to the under 16	0x0D (13)
PURPLE CROSS	Prohibited to the under 18	0x0F (15)

2.2 CONTENT DESCRIPTION

2.3 LCN

The specification IEC/CENELEC 62 216 - 1 [9] which describes the basic profile of the terrestrial TV terminal, defines an identifier logical_channel_number, a field with 10 bits broadcast by a private descriptor logical_channel_number_descriptor, which is present in the table NIT.

This identifier, which is associated with each service of the network, allows the terminal to present display of the programme numbers in a user-friendly manner in the list of services proposed.

The descriptor logical_channel_number_descriptor has the following structure :

Syntax	Number of bits	Identifier
Logical_channel_number_descriptor () {		
descriptor_tag	8	Uimsbf
descriptor_length	8	Uimsbf
for (i=0 ;i<N ;i++) {		
service_id	16	
visible_service_flag	1	Bslbf
reserved	5	Bslbf
logical_channel_number	10	Uimsbf
}		
}		

descriptor_tag : identifier of the descriptor. Value 0x83.
service_id : identifier of the service in the multiplex unit.
Visible_service_flag : not used.
logical_channel_number: logical number of the service.

3 SPAIN

Doc used: Implementation Guidelines for DTT in Spain, version: v1.0.2. Date: 27 May 2002 (DRAFT)

3.1 PARENTAL RATING

Besides the DVB parental rating defined values, some other user defined values have been defined for parental control in Spain. The following table describes these user defined values. It also defines the values inside the DVB range that should be used.

Classification	Tag
No recomendado para menores de 7 años	0x04
No recomendado para menores de 13 años	0x0A
No recomendado para menores de 18 años	0x0F
Clasificado X	0x1F
Sin clasificar	0x00

Table 4. - Parental rating used in Spain

Broadcasters are recommended to avoid using other values than defined in this table, since them will not have a meaning for receivers following this specification.

3.2 CONTENT DESCRIPTION

Content nibble definition provided by DVB does not cover all the usual events broadcasted in Spain (*for example.: there is no appropriate content nibble for "Toros"*). Moreover, some content nibbles are two much general (for example: There is a unique content nibble to describe adventure/western/war events).

To provide a description that better matches the values needed in Spain, broadcasters and receivers are recommended to use user nibble values as defined in the following table:

User nibble level 1	Description	User nibble level 2	Description	Meaning
0x0	Sin definir	0x0	Sin definir	
		0x1	Sin definir	
		0x2	Sin definir	
		0x3	Sin definir	
		0x4	Sin definir	
		0x5	Sin definir	
		0x6	Sin definir	
		0x7	Sin definir	
		0x8	Sin definir	
		0x9	Sin definir	
		0xA	Sin definir	
		0xB	Sin definir	
		0xC	Sin definir	
		0xD	Sin definir	
		0xE	Sin definir	
		0xF	Sin definir	
0x1	Cine	0x0	general	
		0x1	suspense	
		0x2	acción	
		0x3	ciencia-ficción	
		0x4	comedia	
		0x5	drama	
		0x6	romántico	
		0x7	histórico	
		0x8	erótico	
		0x9	musical	

		0xA	policíaco	
		0xB	western	
		0xC	aventuras	
		0xD	bélico	
		0xE	infantil	
		0xF	experimental	
0x2	Informativo	0x0	general	
		0x1	el tiempo	
		0x2	actualidad	
		0x3	diario	
		0x4	debate	
		0x5	económico	
		0x6		
		0x7		
		0x8		
		0x9		
		0xA		
		0xB		
		0xC		
		0xD		
		0xE		
		0xF		
0x3	Entretenimiento	0x0	general	
		0x1	concurso	
		0x2	variedades	
		0x3	entrevistas	
		0x4	ofertas	
		0x5	debate	
		0x6	espectáculos	
		0x7	divulgativos	
		0x8	teatro	
		0x9		
		0xA		
		0xB		
		0xC		
		0xD		
		0xE		
		0xF		
0x4	Deporte	0x0	general	
		0x1	evento especial	
		0x2	informativo	
		0x3	fútbol	
		0x4	tenis	
		0x5	atletismo	
		0x6	motor	
		0x7	acuáticos	
		0x8	de invierno	
		0x9	equitación	
		0xA	artes marciales	
		0xB	baloncesto	
		0xC	golf	
		0xD	ciclismo	
		0xE	naútico	
		0xF		
0x5	Infantil	0x0	general	
		0x1	pre-escolar	
		0x2	entretenimiento	
		0x3	concurso	

		0x4	educativo	
		0x5	dibujos animados	
		0x6		
		0x7		
		0x8		
		0x9		
		0xA		
		0xB		
		0xC		
		0xD		
		0xE		
		0xF		
0x6	Música	0x0	general	
		0x1	concierto	
		0x2	directo	
		0x3	entrevista	
		0x4	espectáculo	
		0x5	video clip	
		0x6	ballet	
		0x7		
		0x8		
		0x9		
		0xA		
		0xB		
		0xC		
		0xD		
		0xE		
		0xF		
0x7	Documental	0x0	general	
		0x1	naturaleza	
		0x2	ciencia-tecnología	
		0x3	medicina	
		0x4	viajes	
		0x5	sociológico	
		0x6	educativo	
		0x7	idiomas	
		0x8	actualidad	
		0x9	arte	
		0xA	histórico	
		0xB	cultura	
		0xC	tradiciones	
		0xD	comunicación	
		0xE	nuevos medios	
		0xF		
0x8	Magazine	0x0	general	
		0x1	cine	
		0x2	música	
		0x3	toros	
		0x4	fútbol	
		0x5	deportes	
		0x6	actualidad	
		0x7	economía	
		0x8	cultura	
		0x9	literatura	
		0xA	moda	
		0xB		
		0xC		
		0xD		

		0xE		
		0xF		
0x9	Televentas	0x0	general	
		0x1		
		0x2		
		0x3		
		0x4		
		0x5		
		0x6		
		0x7		
		0x8		
		0x9		
		0xA		
		0xB		
		0xC		
		0xD		
		0xE		
		0xF		
0xA	Ocio	0x0	general	
		0x1	viajes	
		0x2	artesanía	
		0x3	motor	
		0x4	salud	
		0x5	cocina	
		0x6	compras	
		0x7	jardín	
		0x8		
		0x9		
		0xA		
		0xB		
		0xC		
		0xD		
		0xE		
		0xF		
0xB	Toros	0x0	general	
		0x1		
		0x2		
		0x3		
		0x4		
		0x5		
		0x6		
		0x7		
		0x8		
		0x9		
		0xA		
		0xB		
		0xC		
		0xD		
		0xE		
		0xF		
0xC	Serie	0x0	general	
		0x1	suspense	
		0x2	acción	
		0x3	ciencia-ficción	
		0x4	comedia	
		0x5	drama	
		0x6	romántico	
		0x7	histórico	

		0x8	erótico	
		0x9	musical	
		0xA	policiaco	
		0xB	western	
		0xC	aventuras	
		0xD	bélico	
		0xE	infantil	
		0xF	experimental	
0xD	Adulto	0x0	general	
		0x1	hetero	
		0x2	gay	
		0x3		
		0x4		
		0x5		
		0x6		
		0x7		
		0x8		
		0x9		
		0xA		
		0xB		
		0xC		
		0xD		
		0xE		
		0xF		
0xE	Religion	0x0	general	
		0x1		
		0x2		
		0x3		
		0x4		
		0x5		
		0x6		
		0x7		
		0x8		
		0x9		
		0xA		
		0xB		
		0xC		
		0xD		
		0xE		
		0xF		
0xF		0x0		
		0x1		
		0x2		
		0x3		
		0x4		
		0x5		
		0x6		
		0x7		
		0x8		
		0x9		
		0xA		
		0xB		
		0xC		
		0xD		
		0xE		
		0xF		

Table 5. - User nibbles used in Spain

Broadcasters shall still send the content nibble as defined in DVB, regardless if they are sending user nibble for that event.

Receivers following this specification are recommended to use the user nibble value instead of the content nibble when it is present. If no user nibble is present, the content nibble will be used.

Broadcasters are recommended to avoid using other values than defined in both above user nibble or content nibble tables, since they will not have a meaning for receivers following this specification.

3.3 LCN

Different broadcasters operating within one country should choose a service-numbering scheme in order to allow manufactures to present services in the same order to all users (number of TV programs). DVB does not specify directly how to do so, but it is always allowed the use of private descriptors for that purpose.

Examples of these private descriptors can be found in UK (Logical_Channel_Number) or in Sweden (Channel_list_descriptor). The inclusion of a private descriptor could manage also the problematic of regionalization of services (explained below)

Needs further discussion (waiting proposals from ANIEL's members).

4 PORTUGAL

No documentation available.

5 ITALY

No documentation available.

6 NETHERLANDS

No documentation available.

7 AUSTRALIA

Document used: Digital television—Requirements for receivers Part 1: VHF/UHF DVB-T television broadcasts
First published as AS 4933.1—2000. Draft - Ver 3 27 August 2001

7.1 PARENTAL RATING

From spec:12.0 Parental guidance
- Use Code provided by Broadcaster in EIT
- Display Code in EPG (Now &Next)

- Provide 'Lock-out' with PIN access

The Australian Parental Guidance classification codes for television programs when transmitted, are intended to be displayed, and form a part of the parental service locking mechanism in a digital receiver.

Unlike the DVB European usage, the Australian code is based on program content without age assignment. The transport stream EIT will generally include the DVB parental_rating_descriptor (Tag = 0x55) and associated information but the receiver should use the 'look-up' table given in Appendix-F for the on-screen EPG display and the lock-out set-up screen.

The receiver should check the parental_rating_descriptor as indicated in the EITnow/next, when accessing a program, and if the parental guidance lock-out is activated, blank the program if the parental guidance rating is exceeded.

From appendix F:
AUSTRALIAN PARENTAL GUIDANCE CODES
(Normative)
Recommended on-screen-display for parental guidance codes transmitted within DVB-SI EIT information using the DVB parental_rating_descriptor.

| Trans mitting Hex code | Australian parental guide code | On-screen display | Reciever menu set-up and suggested OSD wording for setting blocking (Restriction of access) | | | | | | | |
			Block All	Block G and above (optional)	Block PG and above	Block M and above	Block MA and above	Block AV and above	Block R and above	No Block
			Resultant receiver action to received hex code is show program - X is block until PIN entered							
0x00	Not classified	-	X							
0x01		-	X							
0x02	P Pre school	P	X							
0x03		P	X							
0x04	C Children	C	X							
0x05		C	X							
0x06	G General	G	X	X						
0x07		G	X	X						
0x08	PG Parental Guidance Recommended	PG	X	X	X					
0x09		PG	X	X	X					
0x0A	M Mature Audience 15+	M	X	X	X	X				
0x0B		M	X	X	X	X				
0x0C	MA Mature Adult Audience 15+	MA	X	X	X	X	X			
0x0D		MA	X	X	X	X	X			
0x0E	AV Adult Audience, Strong violence 15+	AV	X	X	X	X	X	X		
0x0F	R Restricted 18+	R	X	X	X	X	X	X	X	

Notes on Australian Parental Guidance Codes:
a. The parental guidance set-up in a receiver allows the user to set a maximum parental guidance rating level so that the receiver will only show programs below that level while a PIN number controls access to higher level programs.
b. The OSD column in the above table should be used in the parental guidance fields of the receiver's displayed electronic program guide.
c. In the case of 0 ☐00 and 0 ☐01, a dash should be displayed.
d. The rows shown in Bold characters show the codes that are expected to be in transmissions but receivers should react to all codes.
e. The inclusion of a 'Block G and above' function as shown the above table in the receiver's OSD is optional.

7.2   CONTENT DESCRIPTION

· Note Australian variation to DVB

- Content_nibble_level_1 as shown
- Content_nibble_level_2 and user_nibble currently not defined.

Receivers may display as required, a program's classification/genre type as identified by the content_descriptor (Tag value 0x54) found in the EIT.
Only the content_nibble_level_1 is currently defined and is as follows:

Content_nibble_level_1 code	Description
0x0	Undefined content
0x1	Movie
0x2	News
0x3	Entertainment
0x4	Sport
0x5	Children's
0x6	Music
0x7	Arts/Culture
0x8	Current Affairs
0x9	Education/Information
0xA	Infotainment
0xB	Special
0xC	Comedy
0xD	Drama
0xE	Documentary
0xF	Reserved - not defined

7.3   LCN

From spec 3.4 Assigning Numbering to Services and navigation

Receivers should:
- Provide as a minimum, a menu listing of available services
- Logical Channel Numbering should be used for Menu listing and Remote-Control selection
- Assign Services without LCNs to numbers starting at 350
- Provide facility for number deletion and re-ordering for 'favorites'.
- Check NIT and SDTs on a regular 10 second basis as broadcasters may dynamically change available services – eg switch from HD to multichannel/multiview services.

Receivers should refer to the current_next versions of the NIT and SDT. Receivers should also be able to interpret LCN associated SI information including:
- preferred_name_list_descriptor (SDT Tag 0x84), which may list alternative preferred names for a service, and
- preferred_name_identifier_descriptor (EIT Tag 0x85), which identifies the current preferred service name.

At some receiving locations there may be up to 100 services to be listed in the receiver's menu. To bring some order to this, the system of Logical Channel Numbers (LCNs) has been adopted in Australia. Similar to the UK DTG and EACEM use, this information is carried in the NIT. It assigns each service in each transport stream a unique number between 1 to 999, allowing the viewer rapid navigation via entry of the desired number on the remote control. Australian broadcasters will use an 'Operational Practice' convention which assigns LCNs to correspond to the broadcaster's 'brand' number.
The LCN is identified by a new descriptor, the Logical Channel Descriptor (tag value 0'83) that is included in the cyclic 2nd loop of the NIT. Each service in a transport stream is identified both by a program_number (service_id) in the corresponding program_map_section and an LCN in the NIT.

Services may be included irrespective of their running status and if the broadcaster chooses to include on a non-running service with a linkage_descriptor (type-5 Tag 0x4A), the receiver should interpret that and take the viewer to the alternative service.
Information on this is found in AS 4599 Section 6, Clause 6.2.8.4 (Aus) and further in Amendment 1 which corrects some detail in the first publication.
The logical_channel_descriptor is detailed by the UK DTG and European EACEM receiver specifications although these specifications include some notes on SI shared between transmissions (multiplexes) which is not applicable in Australia.
If services without a logical channel number are encountered they should be allocated service numbers in an "overflow" area commencing at 350.

8 UK / D-BOOK

Document used: Digital Terrestrial Television, Version: 3.01. Last Updated: 11 February 2001

8.1 PARENTAL RATING

From d-book: 8.5.2.3 Parental Rating Coding
Parental rating coding is not defined by this document. It is a CA function.

8.2 CONTENT DESCRIPTION

From d-book: 8.5.2.2 Content (Genre) Coding
This coding identifies the genre of the programme (event).It is carried within the content descriptor of the EIT.
Each event shall be given a maximum of one content description from the UK DTT list in Table 8-6.
Codes are assigned in line with Table 18 in ETS 300 468 [4] (content definition table),and mapped from the DVB SI table.
Content nibble level 1 only is significant. Content level 2 defines sub-genres the use of which is not defined by this document.
Drama is distinguished from Movies by being assigned a User defined code (0xF0)
If there is no content coding in conformance with Table 8-6 present for an event, the default content description "unclassified " applies..
Note that content descriptors from other delivery media may use a different coding method for the content.

Content_nibble_level_1	DVB Description (for information only)	DTT Description
0x0	Unclassified	Unclassified
0x1	Movie/Drama	Movie
0x2	News/Current affairs	News and Factual
0x3	Show/Game show	Entertainment
0x4	Sports	Sport
0x5	Children 's/Youth programmes	Children 's
0x6	Music/Ballet/Dance	Entertainment
0x7	Arts/Culture (without music)	News and Factual
0x8	Social/Political Issues/Economics	News and Factual
0x9	Education/Science/Factual Topics	Education
0xA	Leisure hobbies	Lifestyle
0xB	Special Characteristics	not supported
0xC to 0xE	Reserved for future use	not supported
0xF	user defined	Drama

Table 8-6. Programme G nre Coding

8.3 LCN

From d-book: 8.5.2.6 Logical channel descriptor
The logical channel descriptor provides a default channel number label for services. This information is quasi-static. The logical channel descriptor may be inserted once in the second descriptor loop of the NIT .

Syntax	No. of bits	Mnemonic
Logical_channel_descriptor{		
Descriptor_tag	8	Uimsbf
Descriptor_length	8	Uimsbf
for (i=0; i<N; i++){		
Service_id	16	Uimsbf
Reserved	6	Bslbf
Logical_channel_number	10	Uimsbf
}		
}		

Table 8-8. Logical Channel Descriptor

descriptor_tag This shall be assigned to be [0x83]
service_id This is a 16-bit .field which serves as a label to identify this service from any other service within the Transport Stream.The service_id is the same as the program_number in the corresponding program_map_section.Services shall be included irrespective of their running status.
reserved All "reserved " bits shall be set to '1 '.
logical_channel_number this is a 10-bit field which indicates the broadcaster preference for ordering services. Its use is defined in Table 8-9:

Logical_channel_number	Description
0	Undefined
1 -999	logical_channel_number
1000 -1023	Rfu

Table 8-9. Logical Channel Number

Rules for the logical channel descriptor
1.All services shall be allocated a logical channel number
2.Each logical channel number shall be used at most once within each SIP
3.The set of logical channel numbers may start at any value, and need not be contiguous.
4.Regional variants of a service (from different SIPs) shall be allocated the same logical channel.
5.Services from different SIPs with the same original_network_id service_id shall have the same logical_channel_number in all SIPs.

Note:The assignment of logical channel number values through time will vary as they reflect the commercial use of the broadcasts. Therefore receivers cannot rely on these values being constant.

9 NORWAY / NORDIG II

Document used: NorDig II Digital Integrated Receiver Decoder Specification for use in cable, satellite and terrestrial networks Version 1.0. Last update 13-06-2001.

9.1 PARENTAL RATING

Nothing specific defined

9.2 CONTENT DESCRIPTION

Nothing specific defined

9.3 LCN

Syntax	No. of bits	Mnemonic
Logical_channel_descriptor{		
Descriptor_tag	8	Uimsbf
Descriptor_length	8	Uimsbf
for (i=0; i<N; i++){		
Service_id	16	Uimsbf
Visible_service_flag	1	Bslbf
Reserved	1	Bslbf
Logical_channel_number	14	Uimsbf
}		
}		

d scriptor_tag: This shall be assigned to be 0x83 (decimal 131)

visibl _s rvice_flag: This 1-bit field when set to '1 ' indicates that the service is normally visible and selectable (subject to the service type being suitable etc.) via the receiver service list. When set to '0 ' this indicates that the receiver is not expected to offer the service to the user in normal navigation modes however the receiver should provide a mechanism to access these services (for example by direct entry of the logical channel number).

reserved: All "reserved" bits shall be set to '1'.

logic_channel_number: this is a 14-bit field which indicates the broadcaster preference for ordering services. It shall be working together with service_type. Each broadcaster shall, as far as possible, allocate unique logic_channel_number within his original_network for each service_type. The logic_channel_number use is defined in the table below:

Visible_service flag	Logical_channel_number (Decimal value)	D scription
0	0	Service not suitable for selection by the user. For example, the value zero may be used for data services only intended for selection from interactive applications or for firmware download services etc.
1	0	Reserved
0	1-9999	Service not displayed in service list (default nor personal) nor ESG, not accessible via P+/- keys. But service shall (if possible) be able to reach from numeric keys (same value as decimal value or logical_channel_number. Service do not have any event information)
1	1-9999	Service displayed in service list and EPG. Accessible from P+/- keys or from numeric keys (same value as decimal value or logical_channel_number)
0	>9999	Reserved for future use
1	>9999	Reserved for future use

10 FINLAND

Document used: Rules of operation of service information in the DTTV network, version 1.3. Last updated 12-09-2001

10.1 PARENTAL RATING

Not defined at Finnish DTTV

10.2 CONTENT DESCRIPTION

See table

Content_nibble_level_1	DVB Description (for information only)	Finnish DTTV
0x0	Unclassified	
0x1	Movie/Drama	
0x2	News/Current affairs	
0x3	Show/Game show	
0x4	Sports	
0x5	Children 's/Youth programmes	
0x6	Music/Ballet/Dance	
0x7	Arts/Culture (without music)	
0x8	Social/Political Issues/Economics	
0x9	Education/Science/Factual Topics	
0xA	Leisure hobbies	
0xB	Special Characteristics	
0xC to 0xE	Reserved for future use	
0xF	user defined	

10.3 LCN

Syntax	No. of bits	Mnemonic
Logical_channel_descriptor{		
Descriptor_tag	8	Uimsbf
Descriptor_length	8	Uimsbf
for (i=0; i<N; i++){		
Service_id	16	Uimsbf
Visible_service_flag	1	Bslbf
Reserved	1	Bslbf
Logical_channel_number	14	Uimsbf
}		
}		

Visible_s rvice flag	Logical_channel_number (Decimal value)	Description
0	0	Service not suitable for selection by the user. For example, the value zero may be used for data services only intended for selection from interactive applications or for firmware download services etc.
1	0	Reserved
0	1-9999	Service not displayed in service list (default nor personal) nor ESG, not accessible via P+/- keys. But service shall (if possible) be able to reach from numeric keys (same value as decimal value or logical_channel_number. Service do not have any event information)
1	1-9999	Service displayed in service list and EPG. Accessible from P+/- keys or from numeric keys (same value as decimal value or logical_channel_number)
0	>9999	Reserved for future use
1	>9999	Reserved for future use

11 SWEDEN

Document used: Digital Terrestrial TV Receiver Specification Minimum Technical Requirements for the Swedish Digital Terrestrial Network Revision 1.0 Date 2002-05-06

11.1 PARENTAL RATING

This descriptor is used to give a rating of programme based on age or other criteria and is used to prevent children from viewing unsuitable programmes. The prevention mechanism, blanking of video and muting of sound, shall be included within the manufacturer software and it should make use of 4 digits pin code. It is recommended to use the pin code on the Viaccess smart card. The 8-bit rating field shall be defined as specified in ETSI EN 300 468, but the interpretation (who also should be displayed in the receiver) is recommended to be in accordance with table 10.

Rating	Description	Translation to be used in S-DTT
0x01-0x04	Children	Barn
0x05-0x08	Youth	Ungdom
0x09-0x0F	Adult	Vuxen

Table 10: Recommended interpretation of the 8-bit rating field

11.2 CONTENT DESCRIPTION

The Zapper IRD should handle all nibbles listed in the DVB SI specification (ETSI EN 300 468), but shall at least be able to handle the ones listed in table 8 below. If there is no content coding in conformance with table present for an event, the default content description "unclassified" shall be assumed by the receiver.

Level 1	Description	Translation to be used in S-DTT
0x0	Unclassified	Odefinierat
0x1	Movie	Film
0x2	News / Current Affairs	Nyheter
0x3	Entertainment	Nöje
0x4	Sport	Sport
0x5	Children's / Youth	Barn
0x6	Music	Musik
0x7	Culture (without music)	Kultur
0x8	Social /political Issues/ Economics	Politik
0x9	Education / Science	Utbildning
0xA	Leisure hobbies	Fritid
0xB	Not supported	
0xC - 0xE	Reserved for future use	
0xF	User defined	

Table 8: Content nibble level1 coding

11.3 LCN

Nothing specific defined

12 CURRENT IMPLEMENTATION, SUGGESTIONS

12.1 PARENTAL RATING

This behaviour is specified in 2.3.5 "Parental control" - MMI-FRS Zapper & ESG v6.2: (AR6-920078KD / C6S13, status: approved) and 4.22 "Access restrictions - locks - set maturity rating" - MMI-FRS Setup menu v3.2 (AR6-920078KD / C6S18, status approved)

E-book behaviour is implemented, supported values 0x00 - 0x0F (age: none, 5-18). Setting this rating is supported through the setup menu. Values 0x10 - 0xFF are defined by broadcaster, not supported in our implementation.

Country:	Missing:
France	CSA symbols 0x10 (universal viewing) 0x11 (parental approval preferable)
Spain	0x1F Clasificado X
Portugal	?
Italy	?
Netherlands	?
Australia	0x01 - 0x0F Completely other interpretation (normative)
UK	-
Norway	-
Finland	-
Sweden	0x01 - 0x0F Completely other interpretation (recommended)

12.1.1 Suggested solution for parental rating

Add 0x10, 0x11, 0x1F to cover France (without the CSA symbols, just text) and Spain, since there is no further overlap at this moment. For Sweden and Australia we need to implement their interpretation. This has implications on the setup menu and the zapper. We could show the correct rating in the zapper banner based on the actual broadcast using the original network id. The setup menu should allow setting according to the selected country.
The problem that arises is that we need to map behaviour of neighbouring countries. As an example: In Sweden we set the rating to Youth (0x05-0x08) and receive a Norwegian broadcast that indicates 0x09 (12 years). When do we lock the system?

12.2 CONTENT DESCRIPTION

This behaviour is specified in 3.3.5 "Long zap banner" and appendix B "Supported themes"-MMI-FRS Zapper & ESG v6.2: (AR6-920078KD / C6S13, status: approved)

E-book content_nibble_1 is made visible through an icon, content_nibble_2 is not supported. Content_nibble_1 value 0x0B (Special characteristics) and 0x0F (User defined) have no icon defined.

C untry:	Missing:
France	Content_nibble_2
Spain	Complete user nibble 1 & 2 interpretation
Portugal	?
Italy	?
Netherlands	?
Australia	Content_nibble_1 interpreted differently
UK	Content_nibble_1 interpreted differently
Norway	Content_nibble_2
Finland	Content_nibble_2
Sweden	Content_nibble_2, however minimum is covered

12.2.1 Suggested solution for content description

Only support content_nibble_1, use a table for nibble 1 per country. This introduces a lot of new strings (supported countries x 16 x osd languages), but covers everything.
Addition of content_nibble_2 introduces numerous strings. Also, we seem to use only content_nibble_1 as an int throughout our code.
For Spain: the spec is just draft. It is not clear whether they will also transmit the content_nibble_1. If not, only interpret user_nibble_1 as content_nibble_1. This will take quite some work, simply to retrieve the user_nibble_1.

12.3 LCN

Current implementation covers E-book, D-book and Nordig.

- Default E-book behaviour is used (1 bit visible, 5 bits reserved, 10 bit LCN),
- Nordig is used for Finland, Sweden, Norway and Denmark (1 bit visible, 1 bit reserved, 14 bit LCN)
- D-book is used for UK (10 bit LCN, 6 bits reserved).

If the LCN is 0, the service is discarded for all user available lists. NORDIG spec reserves Visible_service flag 1 combined with Logical_Channel_number 0.

If the LCN is higher than 999 it is ignored, the service is inserted in the alphabetically sorted part of the service list (see FRS on the sorting algorithm used).

France and UK always (hard-coded) return a service as visible. This should probably be changed to interpret the bit as visible flag. According to D-book (UK) it is a reserved bit, which defaults to 1, so this should be fine. France defines it according to EN 300 468 but does not use it.

Country:	Missing:
France	Service visible flag is defined but not used, now hard coded visible. Should be interpreted.
Spain	?
Portugal	?
Italy	?
Netherlands	?
Australia	-
UK	Service visible flag is not used, according to spec reserved (always 1, visible) Could be interpreted as visible flag.
Norway	Visible_service flag 1 combined with Logical_Channel_number 0 reserved LCN could be up to 9999
Finland	Visible_service flag 1 combined with Logical_Channel_number 0 reserved LCN could be up to 9999
Sweden	Visible_service flag 1 combined with Logical_Channel_number 0 reserved LCN could be up to 9999

12.3.1 Suggested solution for LCN

Always interpret the first bit after the service_id as the visible_service_flag. The current behaviour covers the rest of the issues.

APPENDIX A SUMMARY

Legenda:

-	not in release
x	in release
text	self-explanatory
?	Unknown
\<blank\>	No action required

A.1 PARENTAL CONTROL

C untry:	Missing:	R7	R9
France	CSA symbols	-	-
	0x10 (universal viewing)	Add	x
	0x11 (parental approval preferable)	Add	x
Spain	0x1F Clasificado X	Add	X
Portugal	?	-	-
Italy	?	-	- .
Netherlands	?	-	-
Australia	0x01 - 0x0F Completely other interpretation (normative)	-	Add AUS as language
UK	-		
Norway	-		
Finland	-		
Sweden	0x01 - 0x0F Completely other Interpretation (recommended)	-	-

A.2 CONTENT DESCRIPTION

Only interpret content_nibble_1. Definition matches if country/language match, otherwise mismatches might occur. Eg UK as language will use UK definition, not E-book.

Country:	Missing:	R7	R9
France	Content_nibble_2	-	-
Spain	Complete user nibble 1 & 2 interpretation	-	Nibble1
Portugal	?	-	-
Italy	?	-	-
Netherlands	?	-	-
Australia	Content_nibble_1 interpreted differently	-	Add AUS as language
UK	Content_nibble_1 interpreted differently	Match for UK-	X
Norway	Content_nibble_2	-	-
Finland	Content_nibble_2	-	-
Sweden	Content_nibble_2, however minimum is covered	-	-

A.3 CONTENT DESCRIPTION OVERVIEW

Only for the countries that specified anything this is in the overview.

	E-book	ESP	AUS	GBR D-b ok	SWE
0x0	Undefined	Sin definir	Undefined	Unclassified	Odefinierat
0x1	Movie/Drama	Cine	Movie	Movie	Film
0x2	News/Current affairs	Informativo	News	News and Factual	Nyheter
0x3	Show/Game show	Entretenimiento	Entertainment	*Entertainment*	Nöje
0x4	Sports	Deporte	Sport	Sport	Sport
0x5	Children's / Youth programmes	Infantil	Children's	Children's	Barn
0x6	Music / Ballet / Dance	Música	Music	*Entertainment*	Musik
0x7	Arts / Culture without music	Documental	Arts/Culture	News and Factual	Kultur
0x8	Social / Political Issues / Economics	Magazine	Current affairs	News and Factual	Politik
0x9	Children's Youth: Education / Science / Factual topics	Televentas	Education / information	Education	Utbildning
0xA	Leisure hobbies	Ocio	Infotainment	Lifestyle	Fritid
0xB	Special Characteristics	Toros	Special		
0xC	Reserved	Serie	Comedy		
0xD	Reserved	Adulto	Drama		
0xE	Reserved	Religion	Documentary		
0xF	User defined			Drama	

Proposed solution:
Use E-book as starting point. Add 0xB - 0xE according to Spanish definition, 0xF according to UK definition. Create a separate solution for Australia, both for parental control and content description.
New icons might be added for Toros, Adulto, Religion. Use movie for serie, comedy, drama as well, educational for documentary

A.4 LCN

Do nothing, unless France sets default visible_service_flag to 1. Then always interpret this bit.